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The time period for reply, if any, is set in the attached communication.

1 RECORD OF ORAL HEARING
2
3 UNITED STATES PATENT AND TRADEMARK OFFICE
4

5
6 BEFORE THE BOARD OF PATENT APPEALS
7 AND INTERFERENCES
8

9
10 Ex parte BENJAMIN CHALONER-GILL,
11 ALLISON A. PINOLI,
12 CRAIG R. HORNE,
13 RONALD J. MOSSO,
14 XIANGXIN BI
15

16 Appeal 2008-4615
17 Application 09/845,985
18 Technology Center 1700
19

20
21 Oral Hearing Held: Tuesday, November 18, 2008
22

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25 Before CHARLES F. WARREN, CATHERINE Q. TIMM, and
26 MICHAEL P. COLAIANNI, Administrative Patent Judges.
27

28
29 ON BEHALF OF THE APPELLANT:
30

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1 The above-entitled matter came on for hearing on Tuesday,
2 November 18, 2008, commencing at 2:59 p.m., at the U.S. Patent and
3 Trademark Office, 600 Dulany Street, Alexandria, Virginia, before Suzie,
4 Notary Public.

5 MS. BOBO-ALLEN: Calendar No. 39, Appeal Number
6 2008-4615, Mr. Dardi.

7 JUDGE WARREN: Good morning, Mr. Dardi or good
8 afternoon, rather.

9 MR. DARDI: Good morning.

10 JUDGE WARREN: You have 20 minutes. You may proceed
11 when ready.

12 MR. DARDI: I'd like to spend a few minutes on the
13 indefiniteness issue under 112, second paragraph, and then move on --

14 JUDGE WARREN: If you would -- I believe we are going to
15 dispose of that in favor.

16 MR. DARDI: Oh, okay.

17 JUDGE WARREN: If you would please move on to the next
18 issue.

19 MR. DARDI: Okay. Next issue is the rejection of the
20 Kamauchi (inaudible) for obviousness. The Examiner has admitted that
21 Kamauchi does not teach the claim particle uniformity in the claim. So the
22 Examiner relies on Manev for that teaching. He pointed out in several ways
23 how Manev teaches away from the claimed invention. First of all, Manev
24 stresses fairly emphatically that the particle size should not be too small. So
25 Manev explicitly states that particle size should be greater than one micron,

1 and more possibly greater than five microns, presumably as an average
2 particle size.

3 JUDGE TIMM: Is that with regard to Manev's material only?

4 MR. DARDI: They talk about two materials. First is a
5 precursor material, manganese oxide, and the second material, which is the
6 product battery material, the lithium manganese oxide. Now they teach
7 more or less that particle size, that the particles should not be too small for
8 battery material, the second material, the lithium-containing material. But
9 they also teach that basically your invention is that they can make the final
10 material without disturbing the particle properties, at least with respect to
11 size dramatically from the initial material, the manganese oxide.

12 So if their claims all are directed to an aspect of their processing
13 and in particular the claimed (inaudible), as sort of the second aspect in
14 which Manev teaches away, in the sense that for highly crystalline materials,
15 where the crystallinity is significant for the function, high sheer milling to
16 sort of reduced particle size is known to damage the crystallinity and alter
17 the crystallinity. So they also teach fairly clearly to make battery materials,
18 you would not be milling, or you would avoid milling.

19 JUDGE TIMM: If the Examiner relied on that specific part of
20 the reference in the rejection, it seems to me the Examiner's relying upon
21 what's in the background section of the Manev patent.

22 MR. DARDI: It relates very directly to the combination, as the
23 only method the combination teaches at all for conceivably making the
24 claimed materials like milling. So if you look at Manev and say well, when
25 you view Kamauchi in perspective of Manev, the combination, Manev

1 teaches you don't want to mill these materials. Yet Kamauchi teaches
2 milling and it's the only way of making the claimed composition.
3 Manev teaches that you want large particles. So the question
4 becomes, and they're dealing with the materials obviously. It's only oxides
5 and not the phosphates.

6 JUDGE TIMM: The Examiner seems to be relying on what
7 this reference was teaching with regard to using smaller particles for better
8 electrical properties and -- what's in the paragraph of Column 1, line 34. So
9 the Examiner seems to be using the reference in a more broader capacity, as
10 to what one of ordinary skill in the art would know about the properties of
11 these particles and why you would want to focus on the size of the particles.

12 MR. DARDI: Correct, and it also teaches that if you make the
13 particles too small, the resistivity and packing becomes problematic, and
14 actually detracts from the properties of the resulting product.

15 JUDGE TIMM: Do you think that that aspect goes to more
16 than just the manganese compounds that are specific to the invention of
17 Manev, or --

18 MR. DARDI: There's no reason to think otherwise. I mean the
19 teachings regarding the desirability of small particles is similarly limited to
20 lithium manganese oxides. So if he wants to use that for phosphates, you
21 can't ignore the remaining teachings of Manev, and just selectively say "Yes,
22 we're only going to look at this piece. I'd like to use that piece in
23 combination. I'm going to ignore all the other teachings in here," which
24 suggests that the combination really is not suggested, as the Examiner has
25 proposed.

1 So I think, you know, a number of questions, these are fairly
2 complex materials. There's no suggestion in Manev of these principles
3 applying to the other compositions of Manev. To go beyond Manev, also
4 you know, we presented a declaration, where we reproduce the results in
5 Kamauchi, and show that the claimed compositions weren't produced.

6 So by using appropriate synthesis methods and then milling, we
7 presented data showing that the claimed compositions simply aren't
8 produced. So we don't see any teachings in the combination of the cited
9 references that teaches you how to make the claimed materials.

10 I believe the case law's fairly clear that to destroy patentability,
11 the art has to place the claimed invention in the hands of the public. So if
12 the teachings and the references do not place the claimed invention in the
13 hands of the public, then they don't negate patentability, because the
14 inventive feature then is the ability to be able to do that, to make the
15 materials.

16 With respect to complex compositions of matter, that's often
17 where the inventiveness lies, in terms of understanding and research to be
18 able to synthesize the materials. So I think, you know, we've not gotten
19 hung up on the teachings of Manev and the complexities of an obviousness
20 analysis. We've gone out and produced the data and demonstrated that, you
21 know, the teachings and the references are still insufficient.

22 We think that's unrefuted after the case, that you know, the
23 understanding in the art is that high sheer milling begets small particles. It's
24 a fairly complex process in terms of cracking particles in high heat, fusing of
25 particles. That generally results in a fairly complex product when you're
26 done milling, with very broad particle size ranges, fragments of particles.

1 You could see that in the declaration that we supplied.
2 There's micrographs in there showing materials after milling. We think that
3 supports our position on these particular references.

4 JUDGE COLAIANNI: Counsel, in your declaration that you
5 submitted, did you attach some evidence along with that declaration
6 regarding the experiment that was performed?

7 MR. DARDI: Correct.

8 JUDGE COLAIANNI: Does that attached evidence compute
9 an average particle size, as far as what the tests that you performed
10 produced, for those results of those tests?

11 MR. DARDI: It may not be culled out, but it is in the data. It
12 was --

13 JUDGE COLAIANNI: I'm referring in particular to page ten of
14 your evidence that you attached to your declaration, which is Table 5 or
15 Table 6 for that matter.

16 MR. DARDI: Let's see. How would the average
17 particle -- well, there's a histogram shown on page 14 and 15 of our
18 materials, and based on these numbers, average particle size is about .16
19 microns and .15 microns. So 150 or 160 nanometers, with 24 hours delay
20 time. Now that's based on proper fractions. There's different -- you get a
21 difference (inaudible) of volume fractions.

22 JUDGE COLAIANNI: Okay. Where is that in the evidence?

23 MR. DARDI: If you look at page 14 and 15. That if you look
24 about 50 percent, that would be the mean roughly, particle number. So 50
25 percent on page 14 is about between .159 and .169. But that's consistent

1 with the graph, which shows a peak somewhere between .1 and .2 microns,
2 on page ten.

3 JUDGE COLAIANNI: And how does this evidence show that
4 you don't achieve what's being claimed?

5 MR. DARDI: Well, the claimed compositions have two
6 components. One is the average particle size and the second is the
7 uniformity. I like to analogize, let's say you have the two softballs versus,
8 you know, a ping pong ball and a basketball, you know. It may not be the
9 same average diameter but you can't play basketball with a softball. You
10 know, they have different distributions, particle sizes, and therefore they
11 have different compositions of matter and different properties.

12 That's what Manev is talking about in terms some of his
13 materials, although at a larger particle size, over a micron. Now when you're
14 obviously the size of a basketball and a ping pong ball, you take your
15 particle size distribution by eye. When you're a little bit smaller, in the
16 mini-micron size ranges, there are ways of manipulating powers too. Once
17 you get below a micron for inorganic materials, you can't really manipulate
18 the materials just to give the -- based on existing technology.

19 You can't say yes, I want more uniform material; therefore, I'm
20 going to do X with a filter in it or something. You can't really significantly
21 alter the properties, based on existing technology. If you're at ten microns,
22 you probably can't. The particles are much bigger. At 100 microns, they're,
23 you know, a factor. But 100 is bigger and you're getting more in the range
24 where people have far more tools available to do these things.

25 So you have two properties of materials, and working in a
26 nanometer range, you can't really just manipulate the materials that well.

1 That's sort of even in the greater than a micron range, you know, Manev
2 makes a big deal about being able to synthesize these materials directly with
3 the properties they desire, because cleaning them up afterwards in not very
4 practical.

5 JUDGE COLAIANNI: With regards to this (inaudible), my
6 understanding is (inaudible).

7 MR. DARDI: I'm sorry, I didn't hear you.

8 JUDGE COLAIANNI: Manev was speaking in terms of the
9 lithium manganese oxide, the spinel compound.

10 MR. DARDI: Right.

11 JUDGE COLAIANNI: So with regard to that, there's reference
12 that Manev teaches that the grinding of these spinel materials is not
13 desirable. But is that to be imputed to all lithium oxide materials, lithium
14 plastics, lithium battery materials?

15 MR. DARDI: Well, the crystallinity of these materials is
16 all-important. To the extent that the grinding damages crystallinity, I think
17 without (inaudible) data, that would be people's expectation. If you look at
18 our -- in our declaration at the resulting ground materials, they do look very
19 broken up. You see a lot of fragmented particles undamaged, which one
20 would expect to influence crystallinity.

21 We've seen it in other materials like phosphorous, where
22 milling significantly affects the light emission problems in a nana regime.
23 Because the particles are small, you know, it's fairly used to the damage of
24 crystallinity.

25 JUDGE COLAIANNI: But it is reasonable to grind these
26 particles to a particular size and size distribution?

1 MR. DARDI: You cannot grind it and get the uniformity, no.
2 If you grind it, you get damaged particle size. But the grinding makes a very
3 broad distribution of particles. So you get the basketball and the ping pong
4 ball. You don't get the two softballs.

5 JUDGE COLAIANNI: But in terms of what is being claimed, I
6 mean do --

7 MR. DARDI: The claims have uniformity.

8 JUDGE COLAIANNI: Which is why I'm questioning the data
9 that you provided, because it wasn't clear to me what the average particle
10 size was from your data. So how can you then impute that this shows that
11 you don't -- you can't use Kamauchi to achieve what you're now claiming,
12 the particular particle size and particles size distribution ranges you're now
13 claiming. And you can't really compare to it, because you don't know what
14 that average particle size is.

15 MR. DARDI: I just read it off to you.

16 JUDGE COLAIANNI: Okay.

17 MR. DARDI: I'm not asserting that you can't achieve the
18 average particle size. I'm really not. I'm asserting you cannot achieve the
19 uniformity --

20 JUDGE COLAIANNI: Well, in the Table 5 example, you said
21 the average particle size was 1.5 microns.

22 MR. DARDI: Microns, 150 nanometers.

23 JUDGE COLAIANNI: Okay. So if we look at Table 5, that
24 would be (inaudible) .15 particle size. So according to your Claim 1,
25 looking at Claim 1, what's required by Claim 1?

26 MR. DARDI: Claim 1 requires --

1 JUDGE COLAIANNI: Claim 1 requires essentially no particle
2 of a diameter greater than about five times the average particle size.

3 MR. DARDI: Right.

4 JUDGE COLAIANNI: So that would be five times .15? That
5 would be the acceptable range?

6 MR. DARDI: So there'd be no particles --

7 JUDGE COLAIANNI: Essentially no particles, whatever that
8 means.

9 MR. DARDI: Essentially no particles. The specification would
10 say on the order of one in a million.

11 JUDGE COLAIANNI: Is that in the specification?

12 MR. DARDI: It is in the specification, I believe.

13 JUDGE COLAIANNI: Can you show me what page?

14 MR. DARDI: Okay.

15 (Pause.)

16 MR. DARDI: I have only the published version. I don't have
17 the (inaudible) version, but it's in paragraph 123, that states "An effective
18 cutoff in the tail and the size distribution indicates that there are less than
19 one particle in ten to the 6th that have a diameter greater than the specified
20 cutoff value above the average value."

21 We've presented some third party post-filing publications from
22 exclusively academic publications that show that uniformity of the particles
23 leads to improved battery performance. So we've also shown third party
24 data on that point, which substantiates thoughts in the Applicant's
25 application regarding the desirability of the uniformity of particle size value.

26 (Pause.)

1 MR. DARDI: Do you have any other questions on the
2 uniformity issue, because it is an important concept? I know it is sort of
3 hard to grasp initially when you first see it. But I like the analogy of the
4 different-sized balls or something like that. It's just that the more uniform
5 material (inaudible) has different properties. That's a composition matter.

6 I don't have too much time left, but would it be helpful to
7 briefly touch upon Bodiger and Bi references? Now in these references, the
8 Examiner admits that neither of them disclose amorphous phosphates. But
9 somehow, he asserts that, you know, something's either amorphous or
10 crystalline (inaudible), and therefore obviousness follows from that.

11 But nevertheless, neither reference uses the Bi reference to
12 support the assertion of uniformity of the product material. But Bi is
13 directed only toward oxides and Bodiger is used for the proposition of
14 phosphates. Now for the process of grinding or something, well you say
15 what does it matter?

16 Oxide-phosphate, you put it into a grinder. But the Bi patent is
17 directed to laser pyrolysis, which involves directing vapors or aerosol of the
18 precursor composition into a laser beam, where it's pyrolyzed and essentially
19 fragmented into, you know, small fragments, atoms and ions and radicals, a
20 pretty complex mixture of essentially plasma, a very localized regime that
21 quenches then very quickly what you leave to light beams.

22 So the fact that a phosphate and ion was a fairly complex
23 structure, with a phosphate surrounded by four oxygen atoms, the fact that
24 the phosphate remains intact from the precursor materials into the product is
25 a very surprising result to me. It doesn't follow randomly that the fact that
26 Bi describes the synthesis of oxides, that the approach would be effective at

1 all for the synthesis of phosphates or other materials with the complexity of
2 ions.

3 And the Examiner, I don't believe, has provided any rationale
4 for thinking that the Bi method would be effective in synthesizing these
5 materials. Beyond that, the references don't teach the desirability of
6 uniformity of amorphous phosphates (inaudible). So it seems that it falls
7 short of providing any motivation whatsoever, and Examiner's not provided
8 any other motivation, to my knowledge, in part or any part that would
9 produce the desirability of those particular phosphates. The (inaudible) in
10 Kamauchi are focused on crystalline materials, so they don't really support
11 that concept in fact.

12 JUDGE TIMM: I have no questions.

13 JUDGE COLAIANNI: No further questions.

14 JUDGE WARREN: Thank you very much, counsel.

15 Whereupon, at approximately 3:15 p.m., the oral hearing was
16 adjourned.